1: Environ Mol Mutagen 2000;36(1):5-12 Related Articles, Books, LinkC



# DNA degradation by the mixture of copper and catechol is caused l DNA-copper-hydroperoxo complexes, probably DNA-Cu(I)OOH.

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Free hydroxyl radicals (free (.)OH), singlet oxygen ((1)O(2)), or (. )OH produced b DNA-copper-hydroperoxo complexes are possible DNA-damaging reactive oxyge species (ROS) in the reaction system containing copper, catechol, and DNA. para-Chlorobenzoic acid (pCBA) degradation studies revealed that CuCl(2) mixed with catechol produced free (.)OH. In the presence of DNA, however, inhibition of the pCBA degradation suggested that another ROS is responsible for the DNA degradation. Of a series of ROS scavengers investigated, only KI, NaN(3), and Na-formate-all of the salts tested-strongly inhibited the DNA degradation, suggesti that the ionic strength rather than the reactivity of the individual scavengers could l responsible for the observed inhibition. The ionic strength effect was confirmed by increasing the concentration of phosphate buffer, which is a poor (.)OH scavenger, and was interpreted as the result of destabilization of DNA-copper-hydroperoxo complexes. Piperidine-labile site patterns in DNA degraded by copper and catecho showed that the mixture of Cu(II) and catechol degrades DNA via the intermediate formation of a DNA-copper-hydroperoxo complex. Replacement of guanine by 7-deazaguanine did not retard the DNA degradation, suggesting that the DNA-copper-hydroperoxo complexes do not bind to the guanine N-7 as proposed the literature. Copyright 2000 Wiley-Liss, Inc.

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